

Geoid and Topography Correlations Compared with Various Isostatic Compensation Models for the Equatorial Highlands of Venus.

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The Magellan cycle 4 Venus gravity data and the topography data set are now complete. Because of orbital considerations high quality gravity data is restricted to the equatorial region of the planet. Thus high resolution interpretations relating gravity and topography data for Venus should also be restricted to the equatorial regions at this time. Correlations of geoid (equipotential surface) anomalies with topography variations provide direct information on mechanisms of compensation. In particular, in the shallow source approximation (ie with the horizontal scale or wavelength of density variations large in comparison with the vertical scale) isostatic geoid anomalies are directly proportional to the dipole moment of the local density distribution. We have obtained 5° x 5° average values of observed geoid and topography anomalies for the equatorial highlands on Venus. Regional correlations of this data show strong coherence and in each case have been compared with three isostatic compensation models: Airy, Pratt, and thermal isostasy. Respective parameter values of crustal thickness, depth of compensation and thermal lithosphere thickness have been obtained and will be discussed.

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